ABSTRACT:

This article presents a bidirectional high frequency transformer link inverter with reduced power switches. On the secondary side of the transformer, two switches are used for rectification and four switches are used for the unfolding stage. The latter are switched at low frequency (50 Hz). Furthermore, a regenerative snubber is incorporated to reduce the voltage surge due to the leakage inductance of the transformer's secondary. The proposed inverter is controlled by a deadbeat controller, which consists of the inner current loop, outer voltage loop and a feed forward controller. Additional disturbance decoupling networks are employed to improve the system robustness towards load variations. A 1-kVA prototype inverter is constructed and the deadbeat control algorithm is experimentally verified. The experimental results show that the inverter has high efficiency (86-94%) with low steady-state output voltage total harmonics distortion (1.5%).